

WHAT IS CLAIMED IS:

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1. A chimeric parainfluenza virus comprising a backbone encoded by nucleotide sequences derived from a Kansas-strain bovine parainfluenza virus type 3 genome in which Kansas-strain bPIV3 nucleotide sequences have been substituted with heterologous sequences or in which heterologous sequences have been added to the complete Kansas-strain bPIV3 genome.
 - 10 2. The chimeric parainfluenza virus of claim 1, wherein the heterologous sequences are derived from a human parainfluenza virus.
 3. The chimeric parainfluenza virus of claim 2, wherein the heterologous sequences encode the F and HN glycoproteins of a human parainfluenza virus.
 - 15 4. The chimeric parainfluenza virus of claim 3, wherein the F and HN glycoproteins of an hPIV are derived from human parainfluenza virus type 3.
 5. The chimeric parainfluenza virus of claim 1, wherein the heterologous sequences are derived from an influenza virus or from a respiratory syncytial virus.
 - 20 6. The chimeric parainfluenza virus of claim 1, wherein the Kansas-strain bPIV3 backbone contains mutations or modifications, in addition to heterologous sequences, which result in a chimeric virus having a phenotype more suitable for use in vaccine formulations such as an attenuated phenotype or a phenotype with enhanced antigenicity.
 - 25 7. A recombinant DNA or RNA molecule encoding a chimeric parainfluenza virus comprising nucleotide sequences derived from a Kansas-strain bovine parainfluenza virus type 3 genome in which Kansas-strain bPIV3 nucleotide sequences have been substituted with heterologous sequences or in which heterologous sequences have been added to the complete Kansas-strain bPIV3 genome.
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8. The recombinant DNA or RNA molecule of claim 7, wherein the heterologous sequences are derived from a human parainfluenza virus.

5 9. The recombinant DNA or RNA molecule of claim 7, wherein the heterologous sequences are derived from an influenza virus.

10 10. The recombinant DNA or RNA molecule of claim 7, wherein the heterologous sequences are derived from a respiratory syncytial virus.

15 11. The recombinant DNA or RNA molecule of claim 7, wherein the nucleotide sequences derived from a Kansas-strain bovine parainfluenza virus type 3 genome contain mutations or modifications, in addition to heterologous sequences, which result in a chimeric virus having a phenotype more suitable for use in vaccine formulations such as an attenuated phenotype or a phenotype with enhanced antigenicity.

20 12. A vaccine formulation comprising a chimeric Kansas-strain bPIV3, the genome of which encodes a heterologous epitope, and a pharmaceutically acceptable excipient.

25 13. The vaccine formulation of claim 12, comprising genomic modifications or mutations which result in an attenuated phenotype or enhanced antigenicity.

14. The vaccine formulation of claim 13 in which the modification is derived from a naturally occurring mutant.

15. The vaccine formulation of claim 12 wherein the vaccine is used to modulate the immune response of humans, primates, horses, cows, sheep, pigs, goats, dogs, cats, avian species and rodents.

30 16. The vaccine formulation of claim 15, wherein the vaccine is used to modulate the immune response of human infants and children.